

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of:)	
)	
Amendment of Part 27 of the)	WT Docket No. 07-293
Commission's Rules to Govern the)	
Operation of Wireless Communications)	
Services in the 2.3 GHz Band)	
)	
Establishment of Rules and Policies for the)	IB Docket No. 95-91
Digital Audio Radio Satellite Service in the)	GEN Docket No. 90-357
2310-2360 MHz Frequency Band)	RM No. 8610

**SIRIUS XM RADIO INC.
OPPOSITION TO PETITIONS FOR RECONSIDERATION
OF THE WCS COALITION AND AT&T INC.**

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October 18, 2010

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Sirius XM Radio Inc. ("Sirius XM"), pursuant to Section 1.429 of the Commission's rules, 47 C.F.R. § 1.429, hereby submits its Opposition to the petitions for reconsideration filed by the WCS Coalition and AT&T Inc. in the above-captioned proceedings.¹

I. INTRODUCTION AND SUMMARY.

Sirius XM opposes many of the changes sought by the WCS interests. Although the WCS Coalition and AT&T reconsideration petitions suggest some significant areas of agreement and common ground between the WCS Licensees and satellite radio, those petitions also contain proposals and suggestions that would further weaken protection to Sirius XM's 35 million

¹ See Petition of the WCS Coalition for Partial Reconsideration, WT Docket No. 07-293, IB Docket No. 95-91, GEN Docket No. 90-357, RM No. 8610 (filed Sept. 1, 2010) ("WCS Coalition Petition"); Petition for Partial Reconsideration of AT&T Inc., WT Docket No. 07-293, IB Docket No. 95-91, GEN Docket No. 90-357, RM No. 8610 (filed Sept. 1, 2010) ("AT&T Petition"), seeking reconsideration of the Commission's decision in Amendment of Part 27 of the Commission's Rules to Govern the Operation of Wireless Communications Services in the 2.3 GHz Band, WT Docket No. 07-293, *Report and Order*, Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band, IB Docket No. 95-91, *Second Report and Order*, 25 FCC Rcd 11710 (2010) (the "*Order*"). For purposes of their reconsideration filings in this proceeding, the WCS Coalition and AT&T are referred to jointly as "the WCS Licensees."

listeners and are simply not supported by – and in many cases are flatly inconsistent with – record evidence.

Throughout this proceeding, WCS licensees have responded to Sirius XM's technical analyses with vague, unsupported, and fluid assertions about the commercial convenience of WCS licensees and the availability of WCS equipment. The Commission's fundamental responsibility is to prevent interference from competing spectrum uses based on sound, objective technical evidence and evaluation. While Sirius XM recognizes the importance of promoting wireless broadband and avoiding policies that might unnecessarily stifle that industry's development, WCS licensees' business ease and convenience should never be the primary touchstone of the Commission's analysis, nor should the outcome of that analysis treat satellite radio as a secondary service, frustrating consumers' expectation of receiving satellite radio service free from harmful interference. Judged objectively on the technical record, most of the WCS Coalition's and AT&T's arguments must be rejected.

The WCS Licensees' calls to further loosen the already dangerously lax WCS technical service rules are unjustified and unjustifiable. In particular, the Commission should increase – not decrease – the duty cycle limits placed on WCS user devices, as well as clarify and strengthen the newly adopted rules for WCS fixed stations. Additionally, the Commission should reconsider the coordination rules to ensure that the parties' obligations are clearly articulated and the coordination regime provides sufficient guidance to minimize and mitigate the potential for harmful interference. Declining to fully address these needs up front will only result in substantial ongoing burdens on Commission staff, requiring them to issue repeated rule clarifications, address interference complaints, and take enforcement actions.

The Commission should also avoid regulatory overreach with regard to Sirius XM's terrestrial repeaters, such as would occur under the WCS proposal to require waivers before the Commission can license repeaters that do not qualify for blanket licensing.

Finally, Sirius XM will support the WCS industry's calls for limited and clearly defined extension of the WCS performance benchmarks to provide sufficient time for WCS licensees to proceed with network buildout in a rational and deliberative manner that minimizes the potential for interference to neighboring spectrum users, benefiting all consumers.

II. THE COMMISSION SHOULD REJECT PROPOSED MODIFICATIONS TO THE WCS TECHNICAL RULES THAT INCREASE POTENTIAL INTERFERENCE TO SATELLITE RADIO CONSUMERS.

The technical rules adopted in this proceeding must be firmly based on technical evidence in the record. Unsupported assertions about technology availability and last-minute revisions to WCS business plans cannot justify changes to rules that were ostensibly established to protect satellite radio customers, especially where those changes disregard technical data and other empirical evidence submitted to the record.

The WCS Licensees' reconsideration requests propose wholesale amendment of the rules based on their latest technology infatuation, seeking the ability to develop WCS equipment based on the LTE air interface. The WCS Licensees cite no record evidence to justify this request. They point to no technical justification. They offer no analysis of how this change in air interface will affect satellite radio's 35 million listeners.

Most remarkably, the WCS Licensees offer no explanation for why their industry may have abandoned WiMAX-TDD as their chosen mobile broadband technology after spending years arguing for WiMAX-TDD – claiming the need for technological consistency with global users of this band – while they summarily dismissed Sirius XM's concerns that WiMAX-FDD or

LTE (either TDD or FDD) may be a more likely technology for WCS networks.² Indeed, throughout this proceeding including in their July 2009 demonstrations at Ashburn, the WCS interests have consistently reiterated their intention to build mobile WiMAX systems. Not surprisingly, all interference analyses the WCS interests filed focused their plans for mobile WiMAX. The record contains no technical basis supporting the WCS licensees' new proposals to use LTE, and the FCC may not adopt the LTE-based technical rule changes proposed for the first time on reconsideration.³ Rather, these new proposals must be considered only in a new rulemaking or a further notice of proposed rulemaking in Docket 07-293, where the impact of this technology on satellite radio consumers can be fully examined and understood.

A. The Record Evidence Supports a *Decrease* – Not an Increase – in Duty Cycle Limitations for WCS Devices.

The impact of WCS mobile transmitter duty cycle on interference to satellite radio has been established through analyses filed by both sides and was even demonstrated at Ashburn.⁴

² See, e.g., Letter from Robert L. Pettit, Counsel to Sirius XM Radio Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket No. 07-293, IB Docket No. 95-91 at 14 (filed Jan. 22, 2010) (proposing LTE FDD use of the WCS band); Letter from Paul J. Sinderbrand, Counsel to the WCS Coalition, to Marlene H. Dortch, Secretary, Federal Communications Commission at 2, IB Docket No. 95-91, WT Docket No. 07-293 (filed Jan. 29, 2010) (characterizing the proposed FDD use as an attempt to “hamstring the use of the band for mobile broadband” and declaring “it is questionable whether any equipment manufacturer would even build FDD equipment, and highly unlikely that it could build for the 2.3 GHz band in the United States at prices comparable to those for other mobile broadband devices”).

³ The Administrative Procedure Act requires an agency to provide public notice of proposed rule changes. See 5 U.S.C. § 553(b)(3). Although the Commission may depart from the course it originally proposed, the rules adopted must be a “logical outgrowth” of the policies and evidence in the record. See, e.g., *Ne. Md. Waste Disposal Auth. v. EPA*, 358 F.3d 936, 951-52 (D.C. Cir. 2004); *Aeronautical Radio, Inc. v. FCC*, 928 F.2d 428, 445-46 (D.C. Cir. 1991). In the present proceeding, no rule proposal, technical evidence nor substantive discussion has addressed crafting WCS service rules to enable the use of LTE. To the contrary, the WCS Coalition, the Commission, and Sirius XM have addressed only mobile WiMAX use of the WCS spectrum, and all testing, arguments, and technical rules have proceeded from this expectation. As such, the Commission may not adopt rules based on the use of LTE at this late time.

⁴ See, e.g., Letter from Terrence R. Smith, Corporate Vice President and Chief Engineering Officer, and James S. Blitz, Vice President, Regulatory Counsel for Sirius XM, to Marlene H.

These analyses proved that interference harms the Sirius XM service by increasing the bit error rate in the digital satellite radio stream. A higher duty cycle means a WCS mobile device actively transmits for a higher proportion of time and the excessively high bit error rate caused by the subsequent overload interference surpasses the ability of satellite radio receivers to recover the desired signal. As the *Order* recognized, “a maximum duty cycle limit has been shown to be an important factor in limiting” WCS interference to satellite radio listeners.⁵

Despite this understanding, the *Order* adopted a duty cycle for WCS devices – 38% – that exceeded even the highest duty cycle the WCS Coalition showed in its Ashburn demonstrations would cause harmful interference.⁶ Now, the WCS Licensees ask the Commission to make the duty cycle even worse. No evidence in the record supports their request. To the contrary, the WCS Coalition’s own demonstrations at Ashburn, which allegedly simulated WiMAX-TDD operations, showed that operations at up to a 35% duty cycle limit⁷ caused harmful interference to satellite radio receivers.⁸ Nothing in the record justifies increasing the duty cycle as the WCS

Dortch, Secretary, FCC at 16-17 (filed Aug. 3, 2009); Letter from Jennifer M. McCarthy, Vice President, Regulatory Affairs, NextWave Wireless Inc., at 1-3 (filed November 17, 2008).

⁵ *Order* at ¶ 72.

⁶ *Id.* at ¶ 64. The WCS Coalition asserts that the test case in question employed variable power control up to 250 mW transmit power, a 5 MHz carrier, a 2.5 MHz guard band and up to a 35 percent duty cycle. Under these conditions – each identical or less restrictive than those adopted in the *Order* – muting occurred to a satellite radio receiver separated by more than 3 meters, even with the best-case interference creation and satellite coverage scenarios demonstrated at Ashburn. Despite these facts, the Commission somehow concluded that its newly adopted rules “will reduce the risk of harmful interference to SDARS to a negligible level.” *Id.*

⁷ The WCS Coalition claims to have demonstrated the operation of a WCS transmitter employing a duty cycle of “up to” 35 percent at Ashburn, but the true technical parameters and interference conditions demonstrated are still unknown because the WCS licensees have refused to offer the logs of these tests for analysis by Sirius XM and the Commission. Without these logs, Sirius XM is unable to confirm what ranges of duty cycle and repetition rate were actually demonstrated, rendering these demonstrations of limited value.

⁸ The WCS Coalition’s March 17, 2008 Reply Comments also speak to how critical duty cycle is to potential interference. There, the Coalition stated that increasing the duty cycle from 6% to 43% tripled the distance at which satellite radio receivers were muted. *See Reply*

licensees propose. The record – including the WCS Coalition’s own demonstrations and statements – support only *reducing* the duty cycle.

AT&T correctly acknowledges that broadband services are becoming increasingly spectrum-intensive, with uplink transmissions growing disproportionately.⁹ Sirius XM raised this very point to support strict duty cycle and repetition rate limitations to protect satellite radio consumers from what otherwise would be nearly continuous transmissions by WCS devices.¹⁰ The Commission needs a sound understanding of how this upward duty cycle trend will affect existing adjacent services, like satellite radio, before allowing any additional flexibility for WCS licensees. However, much of the analysis submitted in this proceeding by WCS interests is based on the flawed assumption that WCS uplink transmissions would be infrequent.¹¹ As a result, no data in the record considers the impact of WCS devices operating with the duty cycles that AT&T now requests.¹²

For all these reasons, the Commission must reject the WCS Licensees’ calls to further loosen these necessary interference protections. The Commission should instead reduce the

Comments of WCS Coalition, WT Docket No. 07-293, IB Docket No. 95-91, Attachment B at 20 (filed March 17, 2008). Notably, these tests demonstrate only the effect of out of band emissions in the satellite radio spectrum. No emissions were transmitted within the WCS spectrum, which would have increased the potential for overload, possibly reducing satellite radio reception even further. *Id.*, Attachment B at 12-13 (describing the test setup).

⁹ See AT&T Petition at 19-20.

¹⁰ See Letter from Terrence R. Smith and James S. Blitz, Sirius XM Radio Inc., to Julius P. Knapp, Federal Communications Commission, WT Docket No. 07-293, IB Docket No. 95-91 at 2-3 (filed March 17, 2010).

¹¹ See, e.g., Letter from Jennifer M. McCarthy, Vice President, Regulatory Affairs, NextWave Wireless Inc., to Marlene Dortch, Secretary, Federal Communications Commission, WT Docket No. 07-293, IB Docket No. 95-91, GEN Docket No. 90-357, RM No. 8610, Attachment at 3 (filed Nov. 16, 2008) (“WCS user terminals do not transmit that often. Even for extraordinary amount of uplink data, a given WCS user terminal will on average transmit for just 2 minutes out of every hour (i.e., with an activity factor of 0.029)”) (emphasis in original).

¹² Nor does the docket support AT&T’s assertions, raised for the first time on reconsideration, that the Commission’s adopted FDD mobile device duty cycle is unnecessarily harsh and will thwart the viability of the WCS band. See AT&T Petition at 18-20.

uplink duty cycle limits set on WCS subscriber devices to 25% in the A and B Blocks and 12.5% in the C and D Blocks for all WCS devices other than the class of operations using directional antennas on both ends, such as in backhaul or fixed wireless applications, as supported by the only valid technical evidence in the record.¹³ The Commission should also impose an activity repetition rate limit whereby repetitive activity would not be allowed in every other 5 ms interval.¹⁴

B. Protecting Satellite Radio Consumers Requires Clear Rules and Definitions for Fixed WCS CPE.

Sirius XM supports fixed broadband uses of the WCS spectrum and encourages the Commission to craft rules and definitions to promote these applications. Fixed WCS operations can play a key role in realizing the Commission's broadband goals through residential Internet access services, broadband point-to-point links, and wireless backhaul for mobile broadband networks. Such uses are consistent with the Commission's original intention for this band and, if properly deployed, will provide critical wireless broadband service with less potential for interference to satellite radio consumers. Some WCS spectrum has already been put to similar uses, demonstrating the commercial viability of these applications.¹⁵

¹³ Letter from Terrence R. Smith, Corporate Vice President and Chief Engineering Officer, and James S. Blitz, Vice President, Regulatory Counsel for Sirius XM, to Marlene H. Dortch, Secretary, FCC, WT Docket No. 07-293, IB Docket No. 95-91, at 16-17 (filed Aug. 3, 2009) (demonstrating muting of satellite radio receivers even at 25% duty cycle).

¹⁴ See Letter from Terrence R. Smith, Corporate Vice President and Chief Engineering Officer, and James S. Blitz, Vice President, Regulatory Counsel for Sirius XM, to Marlene H. Dortch, Secretary, FCC, WT Docket No. 07-293, IB Docket No. 95-91, at 5-6 (filed Jan. 5, 2010); Comments of Sirius XM Radio Inc., WT Docket No. 97-293 at 30-31 (filed April 21, 2010).

¹⁵ For example, in addition to the fixed operations discussed in AT&T's and Sirius XM's previous filings, at least one other company is deploying home and business wireless broadband Internet access services using the WCS spectrum. See MegaBroadband, <http://www.megabroadband.net> (last visited Oct. 6, 2010) (offering residential and business broadband services in parts of Massachusetts and Rhode Island).

However, to help the Commission realize its goal of crafting “WCS service rules that will allow the WCS to co-exist with adjacent band SDARS without reaching the threshold of SDARS experiencing harmful interference,”¹⁶ the agency must clarify its definition of fixed customer premises equipment (“CPE”). Similarly, the FCC must reject the WCS licensees’ proposal to eliminate the ban on certain outdoor antennas.

1. The Commission Must Clarify its Definition of Fixed CPE.

Sirius XM agrees with the WCS Coalition that the Commission should clarify the fixed CPE definition as it applies to WCS.¹⁷ For example, it is unclear whether the Commission’s fixed CPE rules are intended to apply to smart meter applications – which were never substantively discussed by any WCS licensees prior to the instant petitions. The confusion about the classification of smart grid systems is evident on the face of the WCS Coalition Petition, which first declares that smart grid applications represent either point-to-point or point-to-multipoint systems,¹⁸ but later implies that smart grid applications should be considered fixed CPE¹⁹ – while at the same time arguing that point-to-point systems should *not* be considered fixed CPE.²⁰

The definitional issues are significant because in the example of smart meters, these devices are likely to be placed near the street, but no data in the record demonstrate what, if any, interference concerns they raise. Nothing filed in this proceeding demonstrates the power or activity characteristics these applications would have or the cumulative interference impact of a

¹⁶ *Order* at ¶ 28.

¹⁷ *See* WCS Coalition Petition at 13.

¹⁸ WCS Coalition Petition at 2 n.2.

¹⁹ *Id.* at 11.

²⁰ *Id.* at 13-14.

city-wide smart grid deployment. Such applications should not be given the benefit of the relaxed service rules of the fixed CPE category without further testing. Notwithstanding the WCS Coalition's claim that smart grid systems demonstrate the need for removing the prohibition on certain external fixed CPE transmitters,²¹ the more likely conclusion is that these devices were not the sort that the Commission contemplated as fixed CPE and that they rightfully belong under the category of base and fixed stations. Alternatively, such devices could be subject to a different set of rules to be determined through testing and technical analysis in a further rulemaking that could also consider the various other use cases, such as WiMAX-FDD, LTE, 2 Watt fixed CPE, and 2000 Watt base stations that were never tested in this proceeding.²²

In any event, Sirius XM agrees with the WCS Coalition that there is tension between the Commission's newly adopted fixed CPE rules and the point-to-point WCS broadband operations that some carriers have already deployed. The uncertainty stems, in part, from the WCS interests' reluctance to specify what types of fixed installations they actually anticipate deploying. Different types of fixed WCS applications will have different interference potential warranting different regulatory treatment. For example, fixed point-to-point microwave relay operations such as those deployed by Stratos in the Gulf of Mexico may pose less risk of harmful interference to satellite radio consumers than some residential or business broadband Internet access deployments. Before the Commission modifies any WCS technical rules, the WCS Coalition should clarify its expected fixed CPE applications and the Commission should develop

²¹ *Id.* at 11.

²² The potential for smart meter applications to be conducted pursuant to multiple geographic leases of WCS spectrum rights by local utilities also raise the concern, discussed further below, of subjecting Sirius XM to the overly burdensome requirement of coordinating with these myriad lessees. *See infra* Section III.B.

a record with thorough test results to assess the potential interference impacts of these applications.

This problem arises because the Commission decided to create a new class of WCS station – fixed CPE – at the 11th hour without the benefit of any specific discussion in the record. No WCS filings, including their test data from Ashburn, directly support allowing fixed WCS devices to operate with up to 2 W, using out-of-band emissions limits that were tested for WCS mobile configurations, and without a guard band in the C and D blocks. The Commission can eliminate this uncertainty by revising the rules to remove the fixed CPE classification and if necessary, addressing the issue in a future rulemaking. The record demonstrates that AT&T and equipment manufacturers are capable of providing fixed services to customers using fixed devices approved under the previous rules.²³

2. No Record Evidence Supports Allowing Outdoor Antennas for Fixed CPE Operating Under the Relaxed Technical Parameters.

The WCS Coalition challenges the Commission’s adoption of a ban on outdoor antennas for fixed CPE operating at 2 W or less as based on insufficient technical data.²⁴ Sirius XM’s Petition for Reconsideration explained that the fixed CPE rules are arbitrary and capricious precisely because, aside from the Commission’s unsupported assumptions about increased separation distances and attenuation due to structural blockages, the changes were based on virtually no technical evidence.²⁵ These rules unjustifiably apply the reduced mobile transmitter OOB limits to fixed devices operating at power limits that are up to 9-12 dB greater than the

²³ See Petition of AT&T, WT Docket No. 07-293, IB Docket No. 95-91, GEN Docket No. 90-357, RM-8610 (filed Aug. 2, 2010). See also n. 15, *supra*.

²⁴ See WCS Coalition Petition at 8-12.

²⁵ See Petition For Partial Reconsideration and Clarification of Sirius XM Radio Inc., WT Docket No. 07-293, IB Docket No. 95-91, GEN Docket No. 90-357, RM No. 8610 (filed Sept. 1, 2010) at 5-10 (“Sirius XM Petition”).

limits applied to mobile devices. Moreover, the fixed CPE rules inexplicably allow these higher power transmissions throughout the entire five megahertz of the C and D Blocks, a scenario the Commission recognized as likely to cause interference even from the substantially lower-powered mobile devices.

In the case of outdoor antennas, no evidence demonstrates that fixed antennas operating with up to 2 W power and mounted to the side of a building have the same potential to cause interference to satellite radio users as mobile/portable WCS transmitters operating at a maximum of 250 mW (or 125 mW in the case of the C and D Blocks). Even accepting the Commission's assertions about the effect of attenuation from in-building placement of fixed CPE transmitters,²⁶ these effects would be nullified if such transmitters are permitted to use outdoor antennas. Any signal attenuation caused by foliage and other blockages would be compensated for through the WCS network's use of automatic transmit power control ("ATPC"), which increases the device transmit power to compensate for such obstructions, thereby increasing the potential for interference to satellite radio receivers. And, in many cases, these same structural blockages would also reduce satellite radio link margins without the benefit of similar compensatory technologies.²⁷ The FCC must reject the WCS Coalition's reconsideration request because no evidence in the record justifies allowing fixed CPE operating at up to 2 W at a 38% duty cycle (and with no guard band in the C and D Blocks) to take advantage of the relaxed OOB restrictions when located outdoors, the FCC must reject the WCS Coalition's request.

²⁶ Cf. J. B. Andersen, T. S. Rappaport, S. Yoshida, *Propagation Measurements and Models for Wireless Communications Channels*, IEEE Communications Magazine, Jan. 1995, at 46-49 (describing variables related to indoor RF propagation).

²⁷ Moreover, foliage and other obstructions attenuating the signal along the path between fixed CPE antennas and WCS base stations' receivers may not provide protection to vehicular satellite radio receivers. Most likely, the path between the fixed CPE antenna and the road where the vehicular satellite radio is located will have a different azimuth than the path back to the WCS base station receiver and will therefore be subject to different levels of fading.

The WCS Coalition illogically claims the lack of harmful interference complaints arising from the existing fixed WCS operations with outdoor antennas justifies removing the outdoor antenna ban for antennas operating pursuant to the new rules.²⁸ Because existing fixed deployments are few and far between, those deployments prove nothing about the interference satellite radio consumers would experience when substantially greater numbers of these devices are deployed, just as the absence of consumer complaints proves nothing about the *potential* for harmful interference. This is particularly the case here, where uncontroverted technical evidence in the record indicates a serious potential for harmful interference. Finally, the WCS Coalition apparently seeks to establish a counterintuitive presumption that the technical rules in place to protect satellite radio consumers should be relaxed past the point where harmful interference is experienced. To use the Coalition's logic correctly, the absence of interference is evidence that the current rules are working, not that they should be relaxed.

In short, outdoor operations should be subjected to further testing before the Commission modifies the WCS rules. Any loosened restrictions on fixed CPE should be clearly and objectively supported by record evidence or simply addressed through a future rulemaking.

C. The New Power Spectral Density Rules Should be Maintained and Applied Equivalently to All WCS Devices.

Both AT&T and the WCS Coalition challenge the spectral density limitation on mobile transmitters of 50 milliwatts in any one megahertz average EIRP power,²⁹ even though the Coalition itself proposed this limit,³⁰ NextWave expressly endorsed it as to the WCS C and D

²⁸ See WCS Coalition Petition at 10-11.

²⁹ See AT&T Petition at 14-16; WCS Coalition Petition at 14.

³⁰ See Attachment to Letter from Paul J. Sinderbrand, Counsel to the WCS Coalition, to Marlene H. Dortch, Secretary, Federal Communications Commission at 14, IB Docket No. 95-91, WT Docket No. 07-293 (filed Aug. 19, 2009) ("WCS Coalition Aug. 19, 2009 Letter").

Blocks,³¹ and the WCS licensees claim to have demonstrated its impact at Ashburn.³² The Sirius XM Petition explained that this limitation is essential to protect satellite radio consumers from harmful overload interference and must be retained.³³

Overload is a significant potential source of interference to satellite radio, and its negative impact increases in direct relation to the amount of the interfering signal's power in close proximity to satellite radio spectrum. Limiting the average EIRP of mobile stations to 50 mW in any one megahertz of authorized bandwidth protects satellite radio receivers from concentrations of interfering signal power. Absent this protection, WCS transmissions could arguably concentrate the entire 250 mW EIRP of authorized power into a smaller bandwidth near the satellite radio spectrum, thereby significantly increasing the potential for overload interference by up to 6 dB for a 1.25 MHz WiMAX channel. Applying this technique in the 2.5 MHz of the WCS C and D Blocks that can be used for mobile operations could effectively nullify the protective benefits of the guard bands adopted for those blocks. As a result, the "50 mW in any one megahertz" power density limit should be maintained.

Moreover, the limitation of 50 milliwatts in any one megahertz average EIRP protects Sirius XM customers against the potentially harmful effects of WCS spectrum aggregation. Aggregating spectrum blocks should not enable WCS licensees to use more transmit power – on either uplink or downlink – than they could otherwise transmit in a single 5 megahertz block. A clearly defined PSD limit ensures that this safeguard stays in place. For these reasons, the

³¹ NextWave Nov. 16, 2008 Letter at 2.

³² *See, e.g.*, WCS Coalition Aug. 19, 2009 Letter, Attachment at 18.

³³ *See* Sirius XM Petition at 9-10.

Commission must reject AT&T's and the WCS Coalition's requests to eliminate the 50 milliwatt limitation on mobile stations.³⁴

III. THE COMMISSION MUST ENSURE THAT COORDINATION PROCEDURES ARE EFFECTIVE TO PROTECT SATELLITE RADIO FROM HARMFUL INTERFERENCE CAUSED BY WCS BASE STATIONS.

Sirius XM remains very concerned that the new rules are inadequate to protect its listeners. Beyond the technical rules, however, one important way the Commission can help ensure its new rules don't create harmful interference to satellite radio is to enact effective mechanisms for communication and coordination between WCS licensees and Sirius XM with respect to base station and terrestrial repeater deployment including mechanisms to ensure effective enforcement, if needed. In general, Sirius XM does not object to imposing equivalent coordination obligations on all parties, such as the WCS Licensees propose. Even more important, however, and to conserve the Commission's resources, the current coordination process must be strengthened and standardized to help prevent and remediate interference.

A. Certain Minor Base Station and Terrestrial Repeater Modifications May be Permitted Subject Only to Subsequent Notification.

Sirius XM understands the WCS Coalition's concern that certain site modifications are unlikely to have a significant interference potential and agrees that a class of modifications should be permitted without coordination, subject only to subsequent notice to the potentially

³⁴ The Commission should also revise Section 27.50(a)(2) to clarify that a similar limitation of 4 watts in any one megahertz peak EIRP applies to WCS fixed CPE, as discussed in the Sirius XM Petition. *See* Sirius XM Petition at 9-10. The new rule for fixed CPE says "the peak EIRP must not exceed 20 watts per 5-megahertz," but because the rule expresses the power limit as a ratio, it could be read to allow licensees aggregating adjacent WCS spectrum blocks to deploy transmitters with a total peak EIRP of 40 or even 60 watts. The prior WCS rules allowed no such flexibility and the potential impact of such a change was inadequately addressed in this proceeding. To remove confusion and prevent unintended consequences, the Commission should revise the fixed CPE rules to specify a peak EIRP of 20 watts within any five megahertz of authorized bandwidth and a peak EIRP of no more than 4 watts within any one megahertz of authorized bandwidth.

affected parties.³⁵ However, the Commission should not adopt the WCS Coalition's proposal allowing WCS licensees to notify Sirius XM within 24 hours after making any modification that does not increase the predicted power flux density ("PFD") at ground level by more than 2 dB.³⁶ First, the 2 dB metric is unsupported in the record. The WCS Coalition did not propose such a rule prior to the adoption of the *Order* and, even now, has provided no details on how such a rule would be implemented. Second, and more importantly, the proposed cut-off could lead to significant interference to satellite radio consumers. As Sirius XM has explained, satellite radio operates with relatively thin link margins and accepting an additional 2 dB of noise could result in muting the satellite radio signal.³⁷ The WCS Coalition's proposal also ignores the potential for a WCS station to undergo multiple modifications over time that, in the aggregate, would have a far more deleterious effect on satellite radio service.

Sirius XM has long supported the use of some ground-based PFD measurement as a benchmark for determining the existence of harmful interference. Consistent with this proposal, Sirius XM would be amenable to allowing WCS licensees to make certain minor technical changes to their deployments, with after-the-fact notification, provided these changes do not result in the ground-level PFD near the WCS base station exceeding an absolute PFD limit -44 dBm from the WCS A and B Blocks, and -55 dBm from the WCS C and D Blocks. These absolute levels are required to ensure that satellite radio receivers are protected in all situations. If the Commission is unwilling to adopt these absolute PFD limits, then these matters should be

³⁵ See WCS Coalition Petition at 20-21.

³⁶ *Id.*

³⁷ See, e.g., Supplemental Comments of Sirius XM Radio Inc., WT Docket No. 07-293, Attachment at 11-12 (filed April 29, 2010) (discussing low link margins of satellite radio and corresponding susceptibility to harmful interference).

resolved through a separate coordination agreement between Sirius XM and the WCS licensees or through a clearinghouse acting on the licensees' behalf.

Alternatively, Sirius XM would also support a limited list of specific types of modifications that can be accomplished with after-the-fact notification, that are unlikely to present significant interference concerns. Any network modifications not on this list would require prior coordination as the Commission required in the *Order*. The rules should also accommodate private agreements between WCS licensees and Sirius XM that implement modified coordination/notification procedures. Sirius XM is willing to work with Commission staff and WCS licensees to develop a list of station modifications not requiring pre-coordination.

B. Sirius XM Supports Equal, but Heightened, Coordination Obligations Between WCS and Satellite Radio Licensees.

The *Order* fundamentally transformed the nature of WCS. Accordingly, despite the WCS Coalition's complaint about different coordination obligations imposed on WCS and satellite radio licensees,³⁸ it was entirely appropriate for the Commission to impose greater coordination requirements on WCS licensees simply because the *Order* created a drastically different potential for the parties to cause interference to each other. Whereas the legacy WCS service rules essentially disallowed mobile applications, the newly adopted rules were consciously designed to facilitate mobile wireless broadband – despite the fact that the Commission previously determined that mobile WCS operations would interfere with satellite radio. In contrast, the technical and operational rules for satellite radio service remain as they have existed for over a decade, with no uses that the Commission previously found incompatible with neighboring spectrum allocations. Even the new repeater rules allow operations fundamentally similar to operations the Commission allows under hundreds of STA grants.

³⁸ See WCS Coalition Petition at 23.

In the interest of comity, however, Sirius XM does not oppose equal coordination requirements – as long as those obligations are enhanced. In so doing, the Commission should clarify and strengthen the pre-deployment coordination procedures as detailed in the Sirius XM Petition and other filings.³⁹ Early and robust coordination will be essential to avoiding interference by WCS base stations. Advanced coordination will be satellite radio customers' last line of defense to protect their ability to receive the service.

Furthermore, contrary to the Coalition's assertions, the Commission should clarify that interference coordination and mitigation is a licensee responsibility that cannot be delegated to lessees of WCS spectrum rights.⁴⁰ Sirius XM should not be expected to coordinate with an indeterminate number of licensees and lessees, requiring Sirius XM to monitor each of the WCS licensees' leasing arrangements, ascertain the status and validity of each lease, and navigate through the different procedures, formats, rule interpretations, and contacts that each licensee or lessee has established for this purpose. This would create an overly cumbersome, inequitable, and unworkable scenario under which Sirius XM could not effectively protect its customers from interference and further demonstrates the need for a single clearinghouse of interference coordination information, as Sirius XM proposed in its Petition for Reconsideration.⁴¹

The formal coordination requirements the Commission adopted to address the potential for WCS interference into AMT facilities are necessary to protect that service. The same

³⁹ See Sirius XM Petition at 18-22; Letter from Terrence R. Smith and James S. Blitz, Sirius XM Radio Inc., to Julius P. Knapp, Federal Communications Commission, WT Docket No. 07-293, IB Docket No. 95-91 (filed March 17, 2010) (outlining a process for identifying and mitigating harmful interference).

⁴⁰ See WCS Coalition Petition at 24-25.

⁴¹ See Sirius XM Petition at 20-21. If the Commission allows a WCS licensee to delegate these obligations to its spectrum lessees, the Commission should state that its enforcement authority gives it the power to enforce compliance against a spectrum lessee. A clear statement placing licensees and lessees on notice that their actions are subject to FCC enforcement will help to ensure compliance and will minimize questions that may arise in the future.

requirements should be applied to satellite radio, to ensure consistency in the way potential interference is addressed on all sides of the WCS band. Since the new rule demonstrates that WCS licensees can coordinate with aeronautical telemetry based on PFD limits, the Commission should provide the same criteria for limiting the interference that WCS base stations may cause to the satellite radio band, namely requiring a -55 dBm and -44 dBm PFD limit for the C/D and A/B bands respectively. In addition to treating the parties equally, a PFD limit will provide increased certainty that satellite radio listeners will not experience harmful interference when passing near WCS base stations, which would typically be located at or near roadways and would thus have an unobstructed line of site to passing vehicles.

The coordination and interference mitigation processes would be greatly facilitated by adopting objective interference criteria that defines tolerable levels of outages due to interference and the corresponding interference probability models used to determine such levels.⁴² In addition to investigating any consumer complaints of interference, Sirius XM will need to conduct pre- and post-deployment testing and active monitoring of service levels to determine whether WCS network buildouts will cause any degradation in satellite radio service quality. Sirius XM will promptly notify both the Commission and the WCS licensee in the event any such disruption occurs, but consumers would be far better protected through an interference mitigation process that clarifies the duties of the respective parties up front and objectively

⁴² The Commission based many of the new rules for WCS mobile services on the demonstrations the parties conducted at Ashburn, VA. Those demonstrations involved only a single WCS base transmitter, yet interference to satellite radio may be exacerbated by operating multiple WCS base transmitters at a single location. Sirius XM's customers and other adjacent spectrum users should not be subjected to higher levels of interference from collocated WCS base transmitters. The Commission should clarify that collocated deployments causing interference may require modifications to all transmitters involved, even if they otherwise operate in accordance with the rules.

defines harmful interference. Sirius XM previously recommended such a process⁴³ and the Commission should revisit this proposal on reconsideration. Without such definitions of the interference criteria and coordination processes, modifications to the existing rules would be ineffective.

IV. THE COMMISSION SHOULD NOT REQUIRE WAIVERS FOR TERRESTRIAL REPEATERS THAT DO NOT QUALIFY FOR BLANKET LICENSING.

There is no benefit to the WCS Coalition's proposal to require use of a waiver process before deploying a terrestrial repeater that qualifies for site-by-site licensing rules.⁴⁴ A waiver process is overly cumbersome and time consuming, particularly where nothing is new or novel about the non-conforming terrestrial repeaters. Many of these repeaters have been operating for years, efficiently serving customers during that time while causing no interference concerns. Requiring Sirius XM to go through the waiver process for these authorizations is unnecessarily cumbersome, time consuming, and wasteful of the Commission's resources, especially in light of the fact that under the *Order*, Sirius XM's site-by-site repeater applications would be placed on public notice with any interested WCS licensee having an opportunity to respond. Furthermore, the new rules afford "potentially affected" WCS licensees broad opportunities to require nonconforming Sirius XM repeaters to power down prior to the WCS licensee commencing operations in a market.⁴⁵ Adequate safeguards already exist to protect WCS licensees from the

⁴³ See Letter from Terrence R. Smith and James S. Blitz, Sirius XM Radio Inc., to Julius P. Knapp, Federal Communications Commission, WT Docket No. 07-293, IB Docket No. 95-91 (filed March 17, 2010).

⁴⁴ WCS Coalition Petition at 21-22.

⁴⁵ As Sirius XM noted in its reconsideration petition, the Commission's definition of a "potentially affected" WCS licensee is grossly overbroad, by treating a WCS licensee as "potentially affected" if it operates a base station in the same Major Economic Area (MEA) or Regional Economic Area Grouping (REAG) as the one in which the terrestrial repeater is located, or if a terrestrial repeater transmits from within 5 km of the border of the MEA or REAG in which the WCS licensee is authorized to operate a base station. Under this rule, WCS licensees operating hundreds, even thousands of miles from the terrestrial repeater could

virtually nonexistent risk of interference from Sirius XM's terrestrial repeaters without imposing a cumbersome and wasteful waiver process on the parties and the Commission staff.

V. THE COMMISSION SHOULD SET CLEAR BENCHMARKS TO PROMOTE COORDINATED DEPLOYMENT OF WCS NETWORKS.

As Sirius XM has noted, some WCS licensees have been warehousing their spectrum holdings for many years, in the hopes of selling their licenses at a premium once more favorable service rules are adopted.⁴⁶ The licensees that acquired rights to the WCS spectrum through the 1997 auction that grossed only \$13.6 million stand to enjoy a significant financial windfall as a result of the increased technical flexibility granted by the *Order*. Spectrum warehousing is the only obvious explanation for why the majority of WCS licensees failed to meet their two previous buildout deadlines when even the WCS Coalition acknowledged that the proposed technical rule changes were “not essential for licensees to meet their revised deadline for providing substantial service.”⁴⁷

Some WCS licensees have nonetheless demonstrated a good faith willingness to deploy their networks promptly and effectively, if given sufficient time and flexibility to do so. In balancing these factors, the Commission should ensure that it sets clear, immutable deployment benchmarks that will require a WCS licensee to actually deploy service to consumers and will allow for orderly and coordinated deployment. In light of the substantial potential for interference to satellite radio consumers posed by a disorganized or poorly coordinated

potentially require Sirius XM to modify its facilities, even when no interference could conceivably occur. A 5 km separation would provide adequate interference protection to WCS receivers operating near Sirius XM's highest powered repeaters. *See* Sirius XM Petition at 21-23.

⁴⁶ *See* Comments of Sirius XM Radio Inc., WT Docket No. 97-293 at 2-3 (filed April 21, 2010).

⁴⁷ *See* Comments of the WCS Coalition, WT Docket No. 07-293, IB Docket No. 95-91, GEN Docket No. 90-357, RM. No. 8610 at 7 n.13 (filed Feb. 14, 2008); Reply Comments of the WCS Coalition, WT Docket No. 06-102 at 11-12 (filed June 23, 2006).

deployment, the Commission should provide sufficient time for WCS licensees to get it right. A thoughtful and rational deployment schedule will ultimately serve the public interest by protecting satellite radio consumers while allowing the WCS licensees to plan and execute their network deployments according to the pace of technological development and actual consumer demand characteristics.

Sirius XM supports the calls by AT&T and the WCS Coalition to extend the performance benchmarks to require WCS licensees provide service to 40 per cent of the population of its licensed service areas by July 2017 and to 75 per cent of the population by July 2020.⁴⁸ This change will allow sufficient time for WCS licensees to undergo coordination and network deployment in a rational and deliberative manner, for the benefit of all consumers. Because several mobile service providers are already beginning to deploy commercial networks based on LTE, this extension should also provide ample time for the WCS licensees to implement their latest preferred air interface. In adjusting this performance benchmark, the Commission should make clear, as it did in the recent decision revoking Globalstar's ATC authority,⁴⁹ that it will tolerate no further delays based on claims of technological challenges, financial difficulties, regulatory uncertainty, or similar reasons.

VI. CONCLUSION.

As detailed above, Sirius XM generally opposes the petitions for reconsideration filed by AT&T and the WCS Coalition because they seek various changes to the Commission's rules that either lack supporting evidence or are directly contrary to technical data and analyses already in the record. However, where common ground exists, Sirius XM joins with WCS interests in

⁴⁸ See AT&T Petition at 9-11; WCS Coalition Petition at 1-2.

⁴⁹ See Globalstar Licensee LLC, IBFS File No. SAT-MOD-20091214-00152, *Order*, DA 10-1740 (rel. Sept. 14, 2010).

asking the Commission to revise the new rules. Sirius XM is also willing to accept certain changes to simplify and streamline the WCS pre-deployment coordination processes, provided that those modifications will not increase the interference threat to satellite radio consumers.

Respectfully submitted,

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October 18, 2010

CERTIFICATE OF SERVICE

I hereby certify that a true copy of the foregoing “Opposition to Petitions for Reconsideration” was deposited in the United States mail, first class postage prepaid, on this 18th day of October, 2010, addressed to the following:

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